CO-EFFICIENT
COLLABORATIVE FRAMEWORK FOR
ENERGY EFFICENT SME SYSTEMS

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COllaborative framework for energy EFFICIENT SME systems

Logistics Service Manager - guidelines

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1 Access to the system

The initial page presents the user with the login interface, through which he/she can give its credentials to access the application functions (Figure 1). User name and password are required.

Figure 1 – Login

Three user profiles are envisaged:

- Company /Customer (using logistic services)
- Logistic operator (providing logistic services)
- Broker (acting as intermediary between the previous two profiles).

It is also possible that the same user plays two roles:

- A company uses the LSM application to plan its internal fleets e choose the best solution for order not served by the internal fleet, then it also acts as broker.
- A logistic provider uses the LSM application to plan its internal fleets and ask for subcontractors, then it also acts as broker

In case the three roles are distinct the broker typically acts “on behalf of the user companies”, to achieve all the possible benefits from demand aggregation and distribute transportation costs in a fair and transparent way among all the participant companies.

In the following we analyse the interface details for each user profile.

2 Access as Broker user

2.1 Main menu

If the user credentials are acknowledged and validated by the system, the user can access the application main menu (**Error! Reference source not found.**).

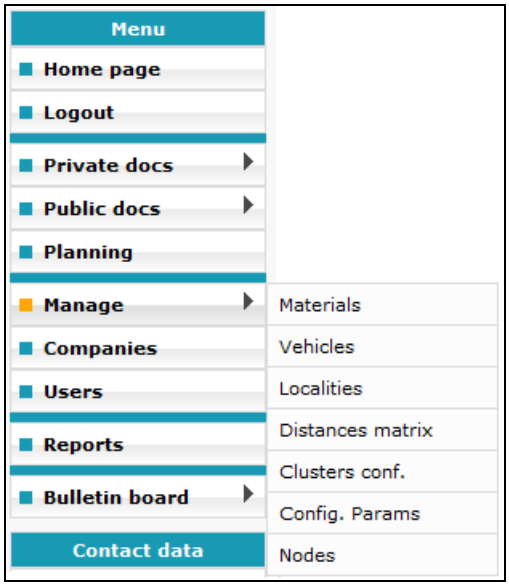


Figure 2 – Main choices for the broker

On the left there is (Figure 2):

- the **user menu**, showing the user name currently logged;
- the general menu, allowing, according to the user rights, to access the functions offered by the application:
  - shows the **Home page**;
  - **Logout** from the application;
  - shows the **Private docs** section: list of transport missions calculated by the planning algorithm, with search options. For each mission it's possible to visualise current state, associated vehicle, route and load/unload operations.
  - shows the Public docs section:
  - shows the **Planning** section: unplanned order are shown and can be selected for planning;
  - shows the **Manage** section:
    - **Materials***:* the current list of defined material types is shown, with the possibility to create, modify and cancel;
    - **Vehicles***:* the current list of defined types of vehicles is shown, with the possibility to create, modify and cancel;
    - **Localities:** the current list allows to visualise and define site address and localities to manage the route geographical area;

  - **Distances Matrix**: a matrix of distances in kilometres used to plan the missions inserted;
  - **Cluster configuration**: the current list shows the cluster configurations, the user can update, modify, insert a new configuration or delete a configuration already inserted;
  - **Configuration parameters:** the current list shows the parameter names to configure the parameters values;
  - **Nodes:** the current list shows the foreign nodes configurations, where other broker applications are published.

- shows the **Companies** section: the current list of companies is shown, with functions of search, creation, change and deletion of the qualified companies, no matter if user companies or logistic operators;
- shows the **Users** section: the current list of authenticated users is shown, with the possibility to search, create, modify and cancel;
- shows the **Reports** section: the section shows the indicators parameters to generate a report.
- shows the **Bulletin Board** section: the section shows the complete list of all request/offers of each company or carrier.

3 Initialize the system - Manage menu

This section shows the possibility for the broker operator to introduce and update basic data that are needed to characterise the behaviour of the planning algorithms (Figure 3).

Figure 3 – Manage menu

3.1 Materials

This section shows the list of types of materials defined for the system, with the possibility of creating, modifying and cancelling a type of material.

The first page shows (Figure 4) shows code and description for each defined type of material. The user can add or discard a material by pressing the **Create** and **Cancel** buttons.

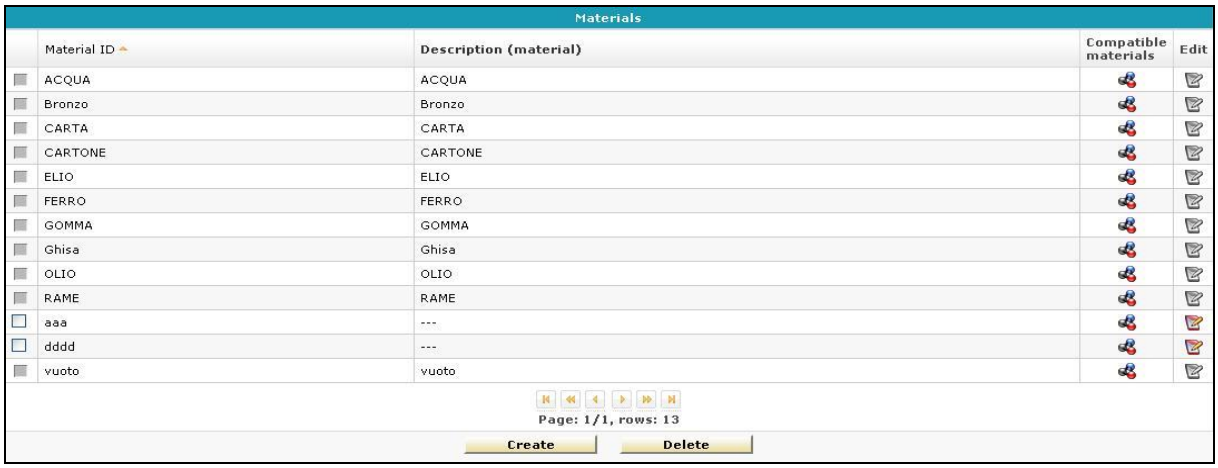


Figure 4 – Materials

The user can also specify the correct compatibilities among materials and modify the details of each material through the icons **Compatible Materials** and **Edit** (Figure 5), respectively.

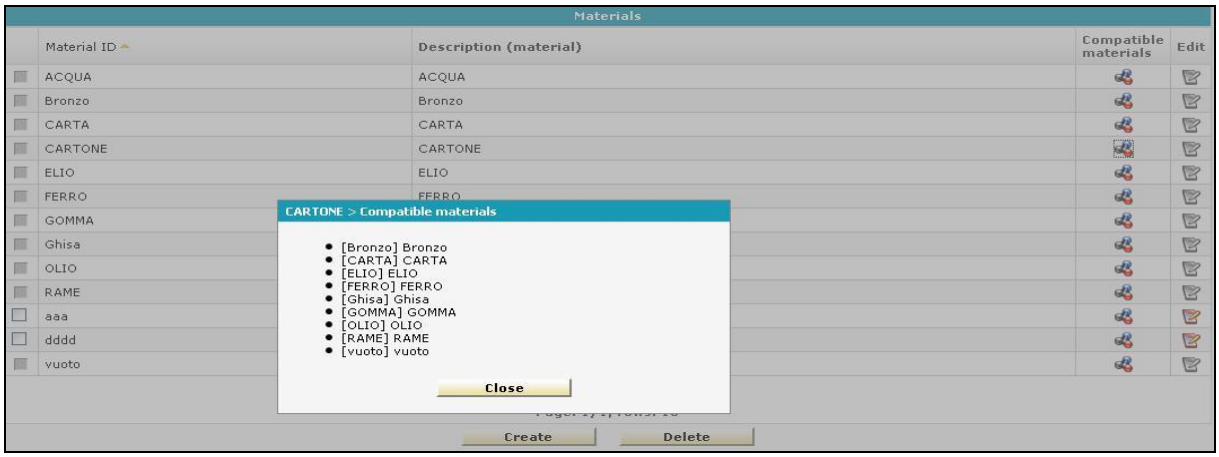


Figure 5 – Compatible materials and material editing

3.2 Vehicles

This section shows the list of vehicles registered into the system, with the possibility of creating, modifying and removing a type of vehicle. The first page (Figure 6) shows for each type of vehicle name, load capacity, length, width, height and speed coefficient.

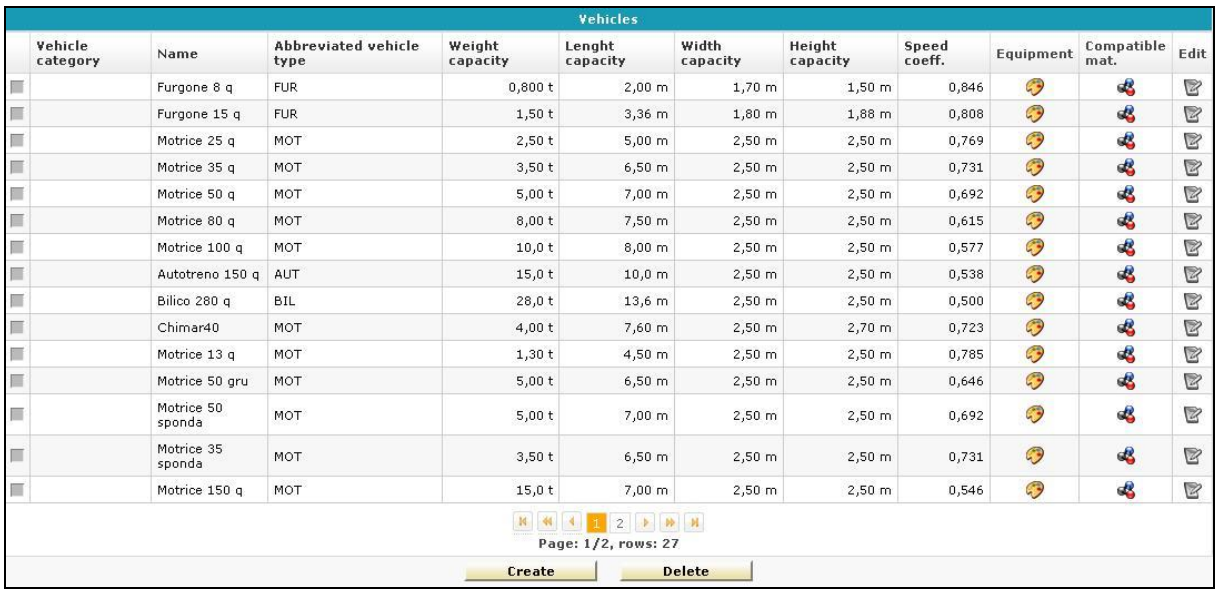

Vehicles
Vehicle category
Name
Abbreviated vehicle type
Weight capacity
Lenght capacity
Width capacity
Height capacity
Speed coeff.
Equipment
Compatible mat.
Edit
Furgone 8 q FUR 0,800 t 2,00 m 1,70 m 1,50 m 0,846
Furgone 15 q FUR 1,50 t 3,36 m 1,80 m 1,88 m 0,808
Motrice 25 q MOT 2,50 t 5,00 m 2,50 m 2,50 m 0,769
Motrice 35 q MOT 3,50 t 6,50 m 2,50 m 2,50 m 0,731
Motrice 50 q MOT 5,00 t 7,00 m 2,50 m 2,50 m 0,692
Motrice 80 q MOT 8,00 t 7,50 m 2,50 m 2,50 m 0,615
Motrice 100 q MOT 10,0 t 8,00 m 2,50 m 2,50 m 0,577
Autotreno 150 q AUT 15,0 t 10,0 m 2,50 m 2,50 m 0,538
Bilico 280 q BIL 28,0 t 13,6 m 2,50 m 2,50 m 0,500
Chimar40 MOT 4,00 t 7,60 m 2,50 m 2,70 m 0,723
Motrice 13 q MOT 1,30 t 4,50 m 2,50 m 2,50 m 0,785
Motrice 50 gru MOT 5,00 t 6,50 m 2,50 m 2,50 m 0,646
Motrice 50 sponda MOT 5,00 t 7,00 m 2,50 m 2,50 m 0,692
Motrice 35 sponda MOT 3,50 t 6,50 m 2,50 m 2,50 m 0,731
Motrice 150 q MOT 15,0 t 7,00 m 2,50 m 2,50 m 0,546
1 2
Page: 1/2, rows: 27
Create
Delete

Figure 6 – Types of vehicle

It is possible to select the materials compatible with a given type of vehicle (icon **Compatible Materials**) and to specify the vehicle features (icon **Equipment**). See Figure 7.

Figure 7 – Equipment icon, compatible materials icon and edit icon

The *Edit* icon (Figure 8) allows to modify name, speed coefficient, load capacity, length, width and height of the selected vehicle type.

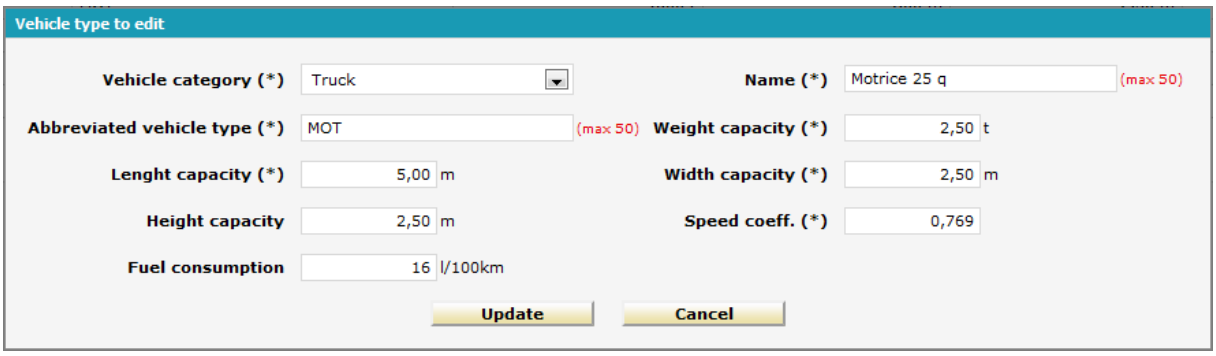


Figure 8 – Edit a vehicle

3.3 Localities

This section shows the list of sites (to visit) defined into the system, with the possibility to create, modify and cancel them.

The first page (Figure 9) shows for each site the name, postal code, province/sub-region, cluster the site belongs to, name, postal code and province can be changed pressing the **Edit** icon. (Figure 10)

For foreign localities it is very important to set the respective foreign broker association (node) to allow the system to insert in the foreign bulletin board the transport offers for return trips.

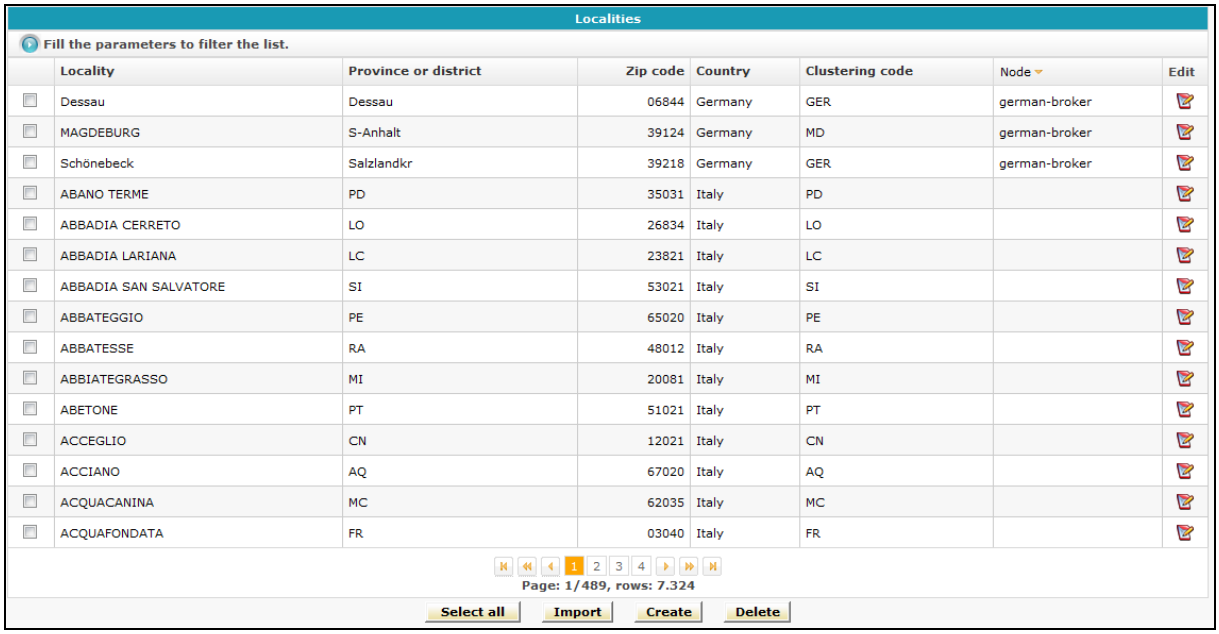

Localities
Fill the parameters to filter the list.
Locality | Province or district | Zip code | Country | Clustering code | Node | Edit
Dessau | Dessau | 06844 | Germany | GER | german-broker
MAGDEBURG | S-Anhalt | 39124 | Germany | MD | german-broker
Schönebeck | Salzlandkr | 39218 | Germany | GER | german-broker
ABANO TERME | PD | 35031 | Italy | PD
ABBADIA CERRETO | LO | 26834 | Italy | LO
ABBADIA LARIANA | LC | 23821 | Italy | LC
ABBADIA SAN SALVATORE | SI | 53021 | Italy | SI
ABBATEGGIO | PE | 65020 | Italy | PE
ABBATESSE | RA | 48012 | Italy | RA
ABBIATEGRASSO | MI | 20081 | Italy | MI
ABETONE | PT | 51021 | Italy | PT
ACCEGLIO | CN | 12021 | Italy | CN
ACCIANO | AQ | 67020 | Italy | AQ
ACQUACANINA | MC | 62035 | Italy | MC
ACQUAFONDATA | FR | 03040 | Italy | FR
1 2 3 4
Page: 1/489, rows: 7.324
Select all
Import
Create
Delete

Figure 9 – Localities

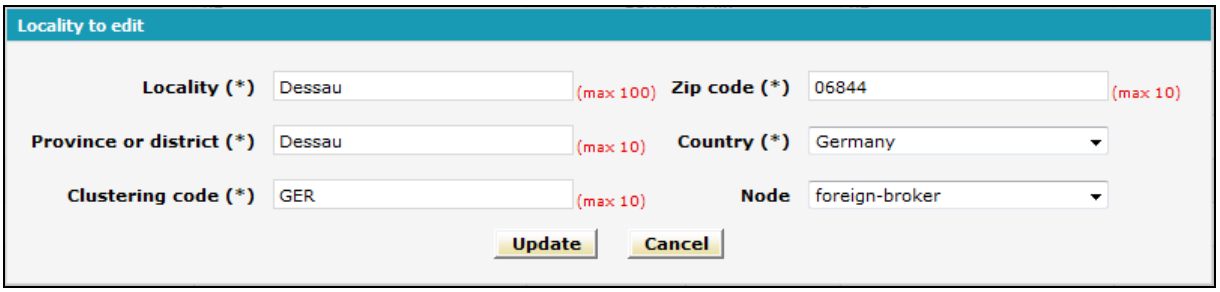


Figure 10 – Edit a locality

4 Insert new companies

The **companies** page (Figure 11, Figure 12) allows to show the list of companies using the service, detailing for each company official name, short name, address, responsible, e-mail and type (user/customer or logistic operator).

It is possible to insert a new company, remove a company, or printing its details through proper buttons in the bottom of the page.

Moreover it is possible to **filter** the results by specifying name, type of company and/or responsible.

Figure 11 – Companies

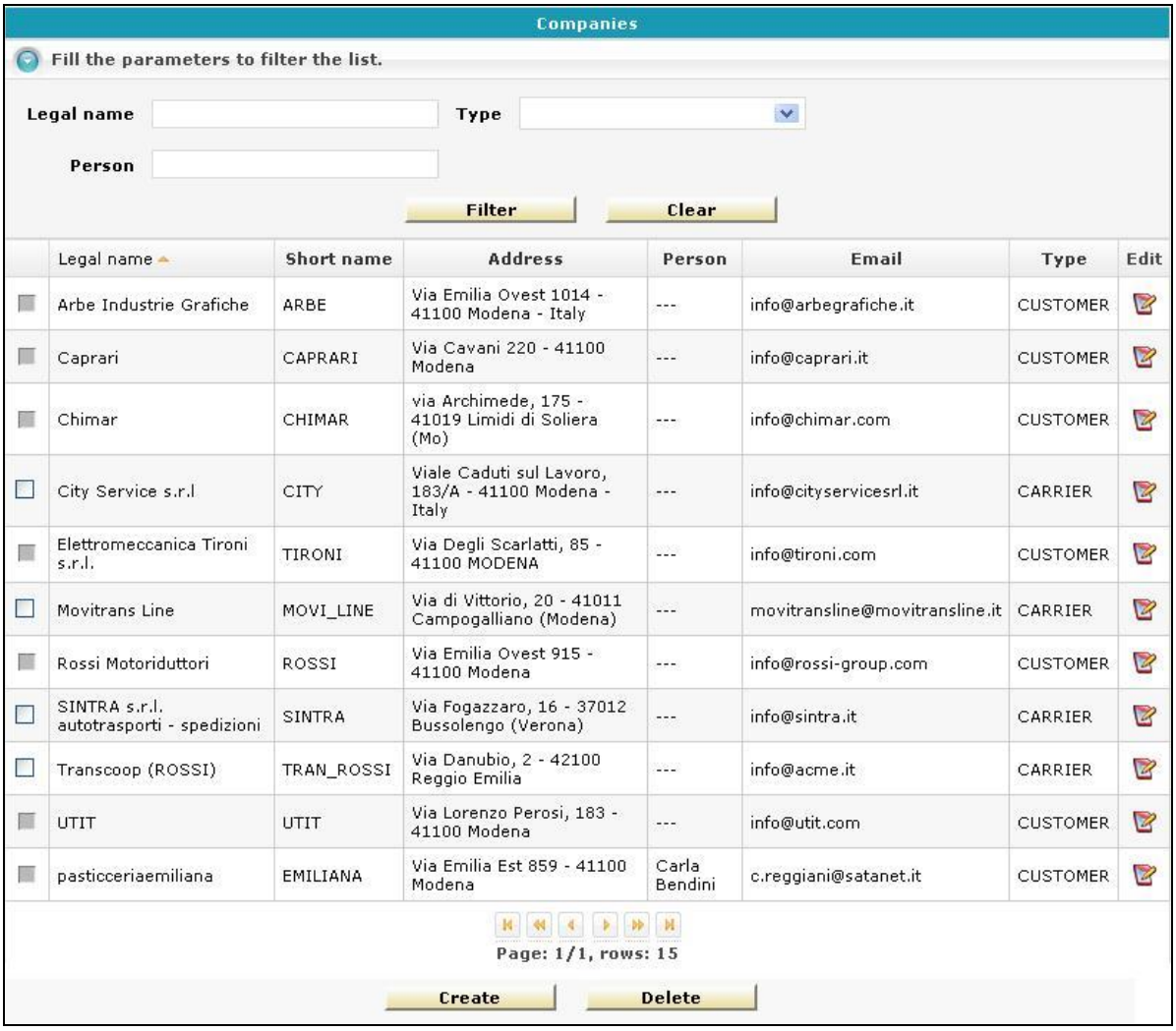


Figure 12 – Companies page

The Edit icon allows to access another page (Figure 13), showing the following contents.

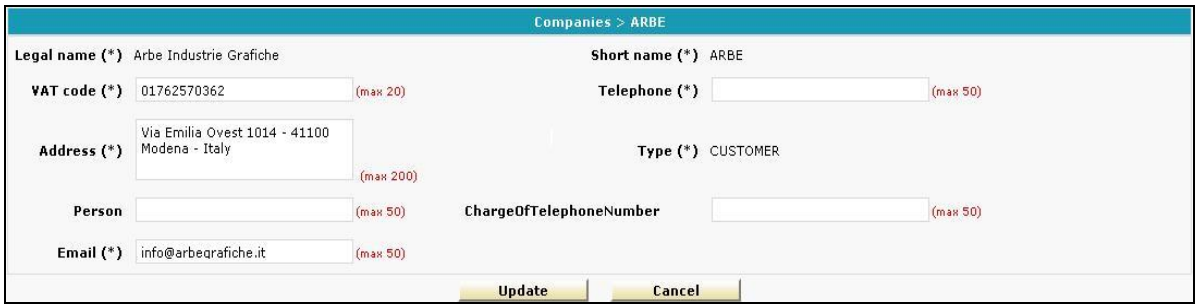


Figure 13 – Edit a company

5 Edit customer company detail

Figure 14 – Personal data menu

5.1 Company to edit

Allows to edit the company information, all the package types used by the company, with possibility of insertion and deletion, fleet - finite capacity**,** sites.

The company detail (Figure 15) allows to specify or modify several fields: official and short name, VAT, telephone, address, type of company (customer), responsible with his/her telephone and e-mail address. It is possible to confirm or discard the changes by pressing the **Update** and **Cancel** buttons.

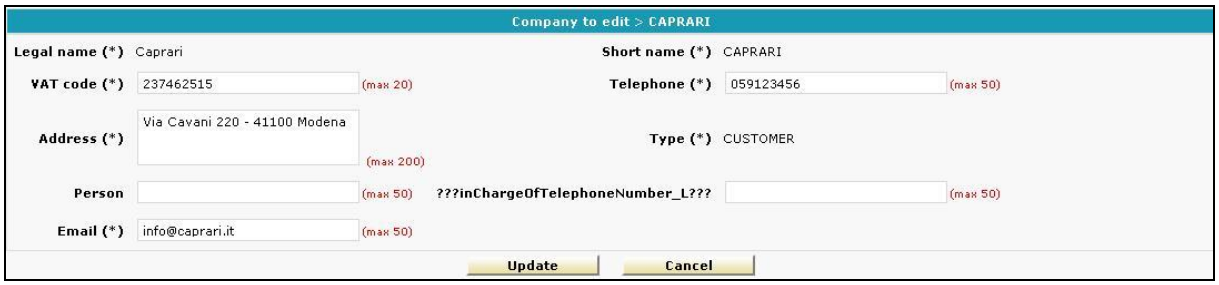
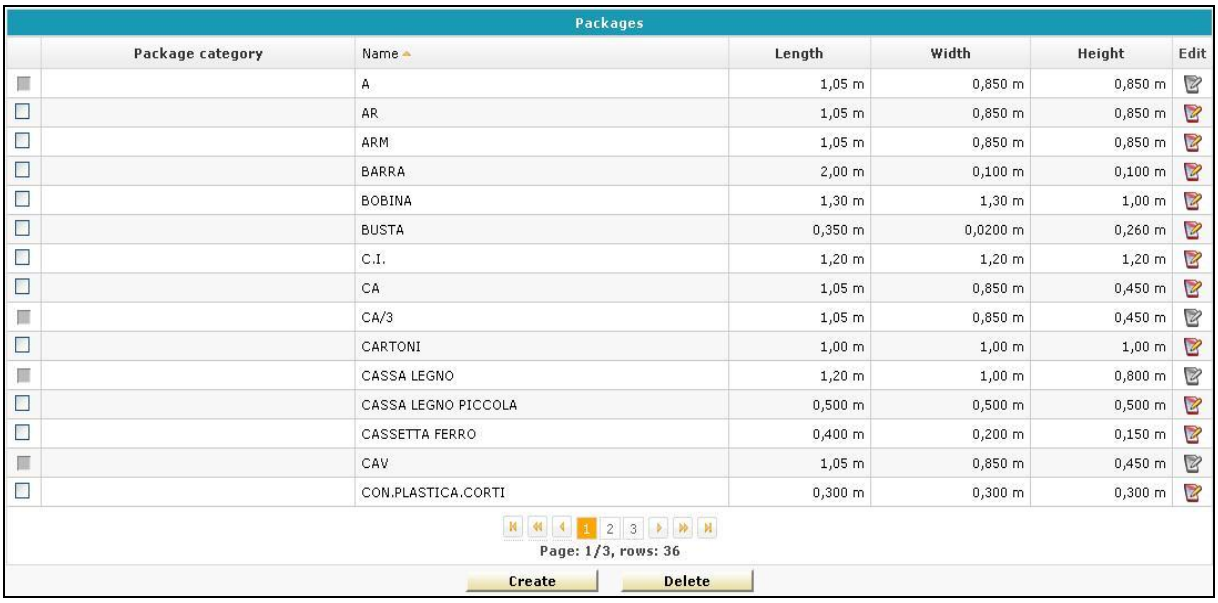


Figure 15 – Edit a company

5.2 Packages

View the section to manage the types of packages, to access the list of package types and, for each type: name, length, width, height, weight in kg. The Edit icon allows to redefine one or more package parameters (Figure 16).



Packages

Package category	Name	Length	Width	Height	Edit
	A	1,05 m	0,850 m	0,850 m	
	AR	1,05 m	0,850 m	0,850 m	
	ARM	1,05 m	0,850 m	0,850 m	
	BARRA	2,00 m	0,100 m	0,100 m	
	BOBINA	1,30 m	1,30 m	1,00 m	
	BUSTA	0,350 m	0,0200 m	0,260 m	
	C.I.	1,20 m	1,20 m	1,20 m	
	CA	1,05 m	0,850 m	0,450 m	
	CA/3	1,05 m	0,850 m	0,450 m	
	CARTONI	1,00 m	1,00 m	1,00 m	
	CASSA LEGNO	1,20 m	1,00 m	0,800 m	
	CASSA LEGNO PICCOLA	0,500 m	0,500 m	0,500 m	
	CASSETTA FERRO	0,400 m	0,200 m	0,150 m	
	CAV	1,05 m	0,850 m	0,450 m	
	CON.PLASTICA.CORTI	0,300 m	0,300 m	0,300 m	

1 2 3

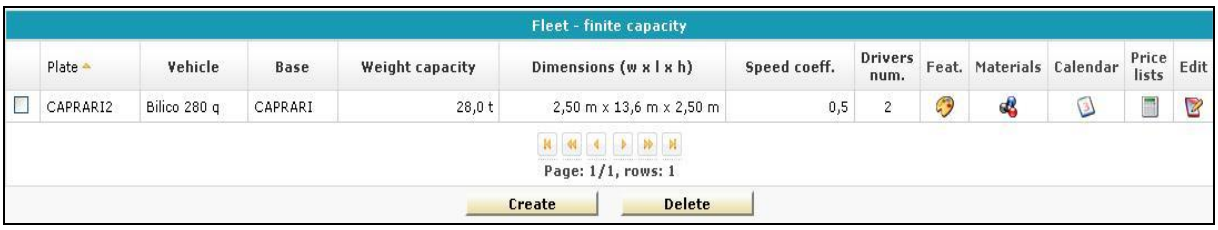
Page: 1/3, rows: 36

Create Delete

Figure 16 – Package list

5.3 Finite capacity fleet

View the section to manage the internal fleet of the company, if available (Figure 17). The list of vehicles belonging to the fleet is shown, and for each truck the following data are reported: type, plate, load capacity, length, width, height, speed.



Fleet - finite capacity

Plate	Vehicle	Base	Weight capacity	Dimensions (w x l x h)	Speed coeff.	Drivers num.	Feat.	Materials	Calendar	Price lists	Edit
CAPRARI2	Bilico 280 q	CAPRARI	28,0 t	2,50 m x 13,6 m x 2,50 m	0,5	2					

Page: 1/1, rows: 1

Create Delete

Figure 17 – Finite capacity fleet

5.4 Sites

It shows the list of sites (at customers, suppliers or subcontractors) that are source or destination for the company transports. It is possible to perform searches, changes and deletions. It is also possible to insert new sites through the automatic import mechanism.

The section sites related to the customer of interest, showing for each site code, name, postal code, province, opening and closing times; the **Edit** icon allows to access and update the fields of the site under consideration, by specifying also the address and whether or not the site is also a warehouse.

The **Import** button allows to import the sites from an **excel** file (Figure 18). It is also possible to add or remove a site through the Create and Delete buttons.

Figure 18 – Import a site

To allow the brokers collaboration, foreign sites must be defined as “FORIGN”. By clicking the Foreign option, the localities list will be populated with only the localities linked to a foreign node.

Figure 19 – Foreign site

6 Edit carrier company detail

The Personal data section allows to crate, update and delete companies, vehicles, and mapping configurations. (Figure 20)

Figure 20 – Logistic operator personal data

6.1 Company to edit

Select **Company to edit** to update the company legal name, VAT code, short name, telephone, address, contact person e-mail and modify the company site information (Figure 21).

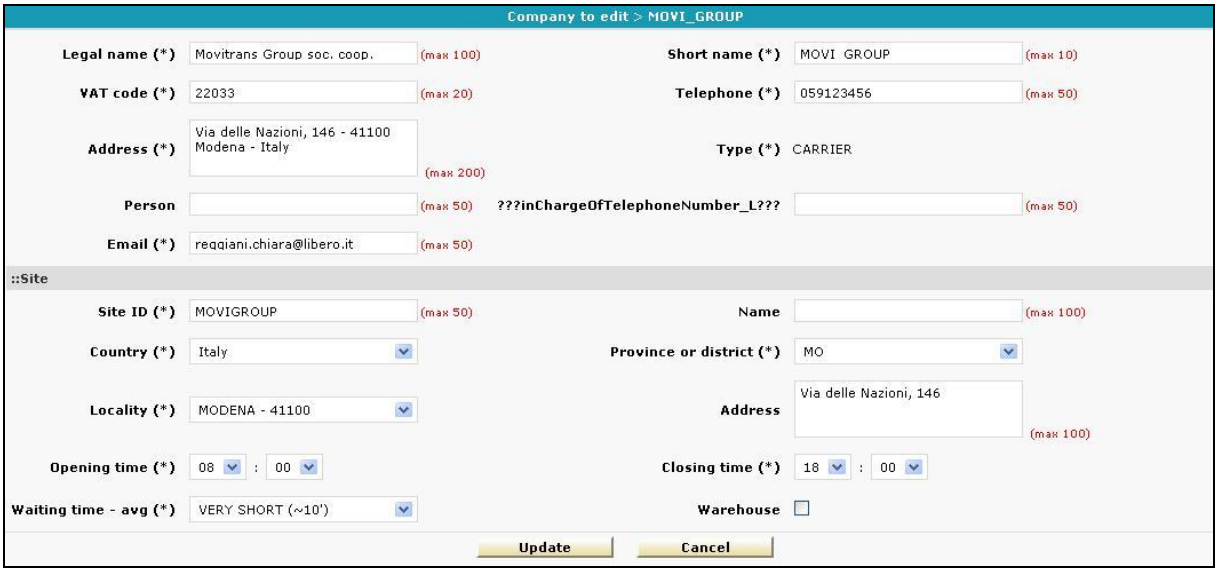
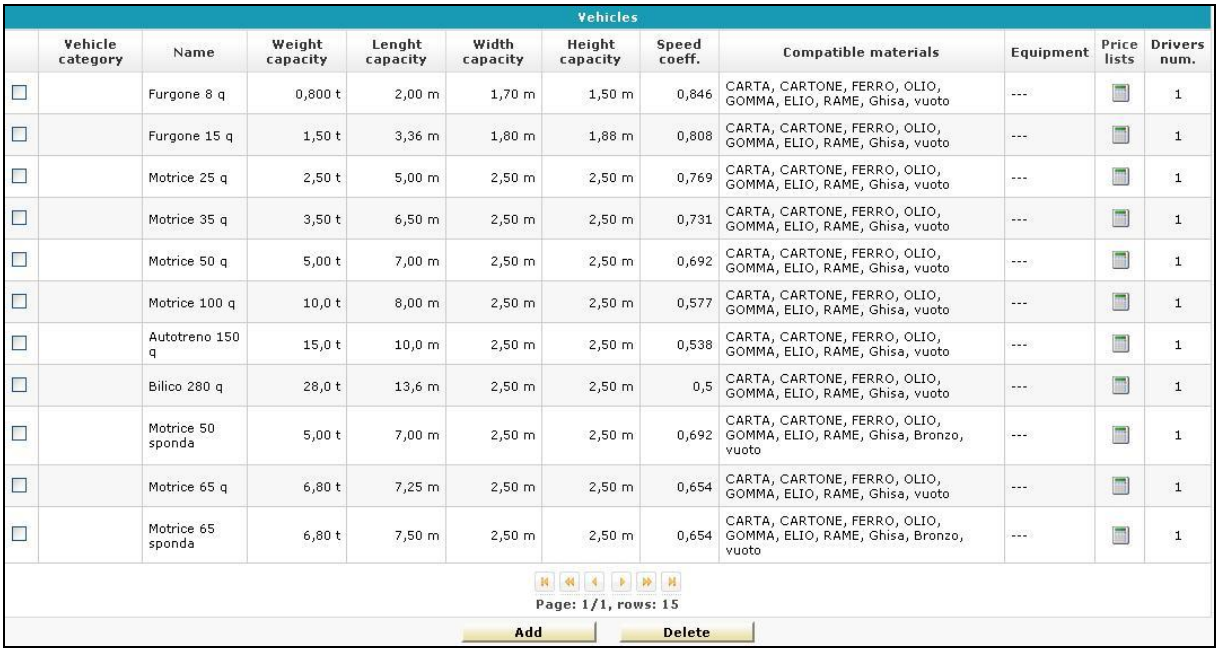

Company to edit > MOVI_GROUP
Legal name (*) Movitrans Group soc. coop. (max 100)
Short name (*) MOVI GROUP (max 10)
VAT code (*) 22033 (max 20)
Telephone (*) 059123456 (max 50)
Address (*) Via delle Nazioni, 146 - 41100 Modena - Italy (max 200)
Type (*) CARRIER
Person (max 50)
???inChargeOfTelephoneNumber_L??? (max 50)
Email (*) reggiani.chiara@libero.it (max 50)
::Site
Site ID (*) MOVIGROUP (max 50)
Name (max 100)
Country (*) Italy
Province or district (*) MO
Locality (*) MODENA - 41100
Address Via delle Nazioni, 146 (max 100)
Opening time (*) 08 : 00
Closing time (*) 18 : 00
Waiting time - avg (*) VERY SHORT (~10')
Warehouse
Update
Cancel

Figure 21 – Company to edit

6.2 Vehicles

Select **Vehicles** to modify the list of vehicle available for transport of goods. (Figure 22)



Vehicles

	Vehicle category	Name	Weight capacity	Lenght capacity	Width capacity	Height capacity	Speed coeff.	Compatible materials	Equipment	Price lists	Drivers num.
☐		Furgone 8 q	0,800 t	2,00 m	1,70 m	1,50 m	0,846	CARTA, CARTONE, FERRO, OLIO, GOMMA, ELIO, RAME, Ghisa, vuoto	---		1
☐		Furgone 15 q	1,50 t	3,36 m	1,80 m	1,88 m	0,808	CARTA, CARTONE, FERRO, OLIO, GOMMA, ELIO, RAME, Ghisa, vuoto	---		1
☐		Motrice 25 q	2,50 t	5,00 m	2,50 m	2,50 m	0,769	CARTA, CARTONE, FERRO, OLIO, GOMMA, ELIO, RAME, Ghisa, vuoto	---		1
☐		Motrice 35 q	3,50 t	6,50 m	2,50 m	2,50 m	0,731	CARTA, CARTONE, FERRO, OLIO, GOMMA, ELIO, RAME, Ghisa, vuoto	---		1
☐		Motrice 50 q	5,00 t	7,00 m	2,50 m	2,50 m	0,692	CARTA, CARTONE, FERRO, OLIO, GOMMA, ELIO, RAME, Ghisa, vuoto	---		1
☐		Motrice 100 q	10,0 t	8,00 m	2,50 m	2,50 m	0,577	CARTA, CARTONE, FERRO, OLIO, GOMMA, ELIO, RAME, Ghisa, vuoto	---		1
☐		Autotreno 150 q	15,0 t	10,0 m	2,50 m	2,50 m	0,538	CARTA, CARTONE, FERRO, OLIO, GOMMA, ELIO, RAME, Ghisa, vuoto	---		1
☐		Bilico 280 q	28,0 t	13,6 m	2,50 m	2,50 m	0,5	CARTA, CARTONE, FERRO, OLIO, GOMMA, ELIO, RAME, Ghisa, vuoto	---		1
☐		Motrice 50 sponda	5,00 t	7,00 m	2,50 m	2,50 m	0,692	CARTA, CARTONE, FERRO, OLIO, GOMMA, ELIO, RAME, Ghisa, Bronzo, vuoto	---		1
☐		Motrice 65 q	6,80 t	7,25 m	2,50 m	2,50 m	0,654	CARTA, CARTONE, FERRO, OLIO, GOMMA, ELIO, RAME, Ghisa, vuoto	---		1
☐		Motrice 65 sponda	6,80 t	7,50 m	2,50 m	2,50 m	0,654	CARTA, CARTONE, FERRO, OLIO, GOMMA, ELIO, RAME, Ghisa, Bronzo, vuoto	---		1

Page: 1/1, rows: 15

Add Delete

Figure 22 – Vehicle list

Click **Price Lists** to create, update, delete a vehicle price list value. Click **Edit** to modify a price list already inserted. (Figure 23)

Vehicles > Furgone 8 q > Price lists

	Type	Name	Clone	Edit
☐	DEFAULT: COVERED PATHS	Listino di default (auto)		
☐	GENERIC: COVERED PATHS	Movitrans Caprari Generic		
☐	GENERIC: COVERED PATHS	Movitrans Group generic		

Page: 1/1, rows: 3

Create Delete Close

Figure 23 – Price list per vehicle

7 Public Docs

The section **Public Docs** (Figure 24) shows the page with the public **transport requests** entered into the system. It's possible to search, modify and cancel items. It's also possible to upload new requests by the automatic import function.

The **Transport orders** show the page containing the list of transport order. It's possible to perform searches, changes and deletions. It is also possible to insert new transport orders through the automatic import mechanism.

The **Transport missions** show the list of transport missions calculated by the planning algorithm, with search options. For each mission it's possible to visualise current state, associated vehicle, route and load/unload operations.

Figure 24 – Public docs

7.1 Insert a new transport request

The Transport request page (Figure 25) shows the page with the public transport requests entered into the system.

A transport request is a service requested by a user company to move goods from a picking site to a delivery site. The service can be performed by a logistic operator or by another user company that provides a vehicle fleet.

Transport request and order are the same document type, in two different status of the document life cycle. It's possible to search, modify and cancel items. It's also possible to upload new requests by the automatic import function.

This kind of logistic document can be inserted into the system directly by the user company that needs the transport service or by the broker.

If the document is private it can be modified/deleted by the creator user. Once it is published, it can only be visualized and then planned by the broker.

Figure 25 shows the list of the private transport requests in the user company workspace. For each item is indicated the import date, the document ID, the picking and delivery sites and times, the list of parcels (Figure 26, Figure 27) and the status.

By clicking the **Change to private** button the document become visible only to user who generates the document.

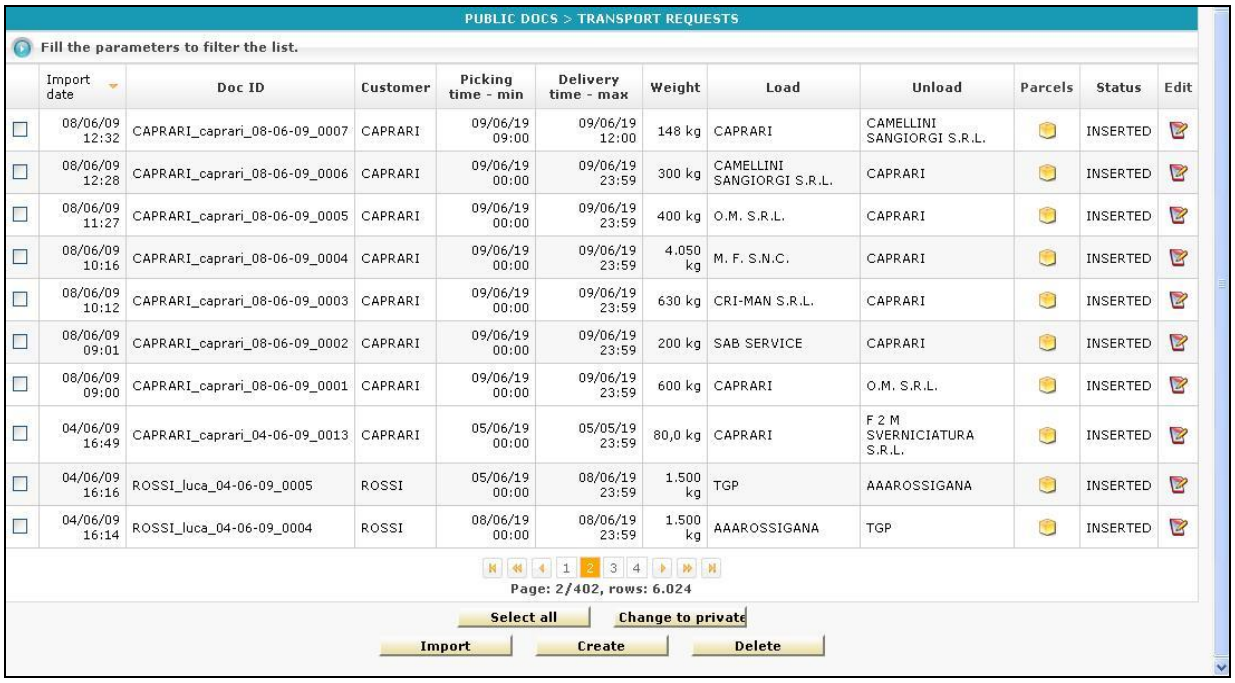

PUBLIC DOCS > TRANSPORT REQUESTS
Fill the parameters to filter the list.
Import date
Doc ID
Customer
Picking time - min
Delivery time - max
Weight
Load
Unload
Parcels
Status
Edit
08/06/09 12:32 CAPRARI_caprari_08-06-09_0007 CAPRARI 09/06/19 09:00 09/06/19 12:00 148 kg CAPRARI CAMELLINI SANGIORGI S.R.L. INSERTED
08/06/09 12:28 CAPRARI_caprari_08-06-09_0006 CAPRARI 09/06/19 00:00 09/06/19 23:59 300 kg CAMELLINI SANGIORGI S.R.L. CAPRARI INSERTED
08/06/09 11:27 CAPRARI_caprari_08-06-09_0005 CAPRARI 09/06/19 00:00 09/06/19 23:59 400 kg O.M. S.R.L. CAPRARI INSERTED
08/06/09 10:16 CAPRARI_caprari_08-06-09_0004 CAPRARI 09/06/19 00:00 09/06/19 23:59 4.050 kg M. F. S.N.C. CAPRARI INSERTED
08/06/09 10:12 CAPRARI_caprari_08-06-09_0003 CAPRARI 09/06/19 00:00 09/06/19 23:59 630 kg CRI-MAN S.R.L. CAPRARI INSERTED
08/06/09 09:01 CAPRARI_caprari_08-06-09_0002 CAPRARI 09/06/19 00:00 09/06/19 23:59 200 kg SAB SERVICE CAPRARI INSERTED
08/06/09 09:00 CAPRARI_caprari_08-06-09_0001 CAPRARI 09/06/19 00:00 09/06/19 23:59 600 kg CAPRARI O.M. S.R.L. INSERTED
04/06/09 16:49 CAPRARI_caprari_04-06-09_0013 CAPRARI 05/06/19 00:00 05/05/19 23:59 80,0 kg CAPRARI F 2 M SVERNICIATURA S.R.L. INSERTED
04/06/09 16:16 ROSSI_luca_04-06-09_0005 ROSSI 05/06/19 00:00 08/06/19 23:59 1.500 kg TGP AAAROSSIGANA INSERTED
04/06/09 16:14 ROSSI_luca_04-06-09_0004 ROSSI 08/06/19 00:00 08/06/19 23:59 1.500 kg AAAROSSIGANA TGP INSERTED
1 2 3 4
Page: 2/402, rows: 6.024
Select all
Change to private
Import
Create
Delete

Figure 25 – Transport request

Click **Parcel** (Figure 26) to list the parcels for each transport request (Figure 27).

Figure 26 – Parcel icon

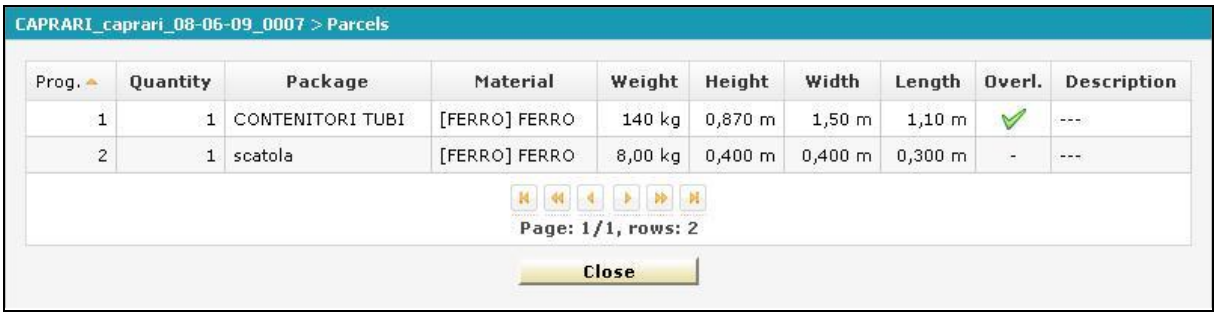


Figure 27 – Parcel list

Click the **Edit** (Figure 28) to open the detail page and to modify the transport request data (Figure 29).

Figure 28 – Edit icon

PUBLIC DOCS > TRANSPORT REQUESTS > CAPRARI_caprari_08-06-09_0007
Customer CAPRARI
Doc ID (*) CAPRARI caprari 08-06-09 0007 (max 50)
Picking time - min (*) 09/06/19
From hours 09 : 00
Delivery time - max (*) 09/06/19
To hours 12 : 00
Load CAPRARI
Unload CAMELLINI SANGIORGI S.R.L.
Status INSERTED
Price --- EUR
Duration 00:02
Groupable
Requires EQUIPMENT
Equipment
Parcels
Prog. Quantity Package Material Weight Height Width Length Description Overl. Edit
1 1 CONTENITORI TUBI [FERRO] FERRO 140 kg 0,870 m 1,50 m 1,10 m ---
2 1 scatola [FERRO] FERRO 8,00 kg 0,400 m 0,400 m 0,300 m ---
Page: 1/1, rows: 2
Create
Delete
Update
Cancel

Figure 29 – Edit a transport request

When a transport request is inserted into the system, its status is automatically set to INSERTED. Furthermore, this request is inserted among the private documents of the user company.

The user company can then publish the request, which will be displayed by the local broker among its public documents. The status of the request is still INSERTED.

When the broker (the planning algorithm) plans the transport request into a transport mission, its status changes to PLANNED.

As soon as the broker assigns the transport mission to a logistic operator and the logistic operator confirms the transport service, the transport request becomes a transport order, and its status changes to ASSIGNED.

When the transport mission is executed by the logistic operator, the transport order status becomes SERVED.

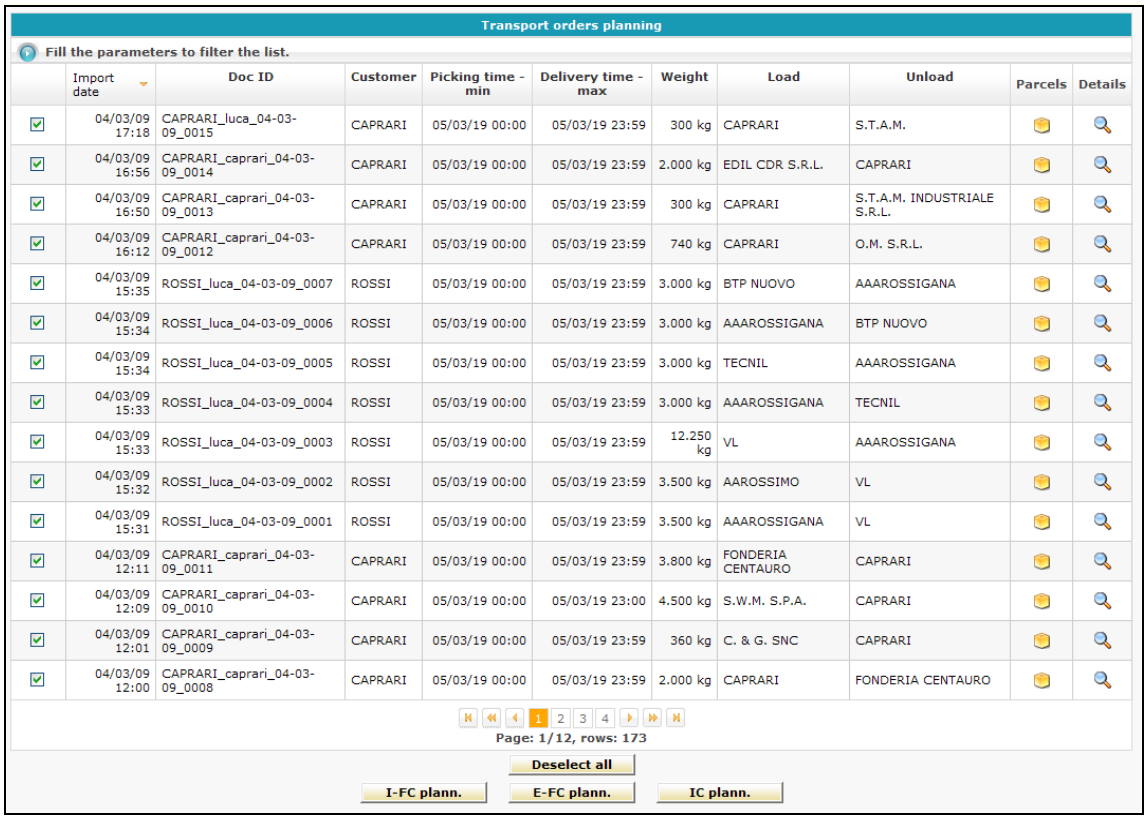
This is the normal life cycle of a transport request, but in any cases there may be exceptions. If the document is not planned before the delivery date, the status becomes EXPIRED.

Otherwise, if request is assigned to a transport mission, but there are no available logistic operators that can perform the transport, the document status changes to SUSPENDED.

8 Planning

By the planning menu item (Figure 30) the broker can list all the transport request inserted and not yet planned (Figure 31).

Figure 30 – Planning menu



Import date	Doc ID	Customer	Picking time - min	Delivery time - max	Weight	Load	Unload	Parcels	Details
04/03/09 17:18	CAPRARI_luca_04-03-09_0015	CAPRARI	05/03/19 00:00	05/03/19 23:59	300 kg	CAPRARI	S.T.A.M.		
04/03/09 16:56	CAPRARI_caprari_04-03-09_0014	CAPRARI	05/03/19 00:00	05/03/19 23:59	2.000 kg	EDIL CDR S.R.L.	CAPRARI		
04/03/09 16:50	CAPRARI_caprari_04-03-09_0013	CAPRARI	05/03/19 00:00	05/03/19 23:59	300 kg	CAPRARI	S.T.A.M. INDUSTRIALE S.R.L.		
04/03/09 16:12	CAPRARI_caprari_04-03-09_0012	CAPRARI	05/03/19 00:00	05/03/19 23:59	740 kg	CAPRARI	O.M. S.R.L.		
04/03/09 15:35	ROSSI_luca_04-03-09_0007	ROSSI	05/03/19 00:00	05/03/19 23:59	3.000 kg	BTP NUOVO	AAAROSSIGANA		
04/03/09 15:34	ROSSI_luca_04-03-09_0006	ROSSI	05/03/19 00:00	05/03/19 23:59	3.000 kg	AAAROSSIGANA	BTP NUOVO		
04/03/09 15:34	ROSSI_luca_04-03-09_0005	ROSSI	05/03/19 00:00	05/03/19 23:59	3.000 kg	TECNIL	AAAROSSIGANA		
04/03/09 15:33	ROSSI_luca_04-03-09_0004	ROSSI	05/03/19 00:00	05/03/19 23:59	3.000 kg	AAAROSSIGANA	TECNIL		
04/03/09 15:33	ROSSI_luca_04-03-09_0003	ROSSI	05/03/19 00:00	05/03/19 23:59	12.250 kg	VL	AAAROSSIGANA		
04/03/09 15:32	ROSSI_luca_04-03-09_0002	ROSSI	05/03/19 00:00	05/03/19 23:59	3.500 kg	AAROSSIMO	VL		
04/03/09 15:31	ROSSI_luca_04-03-09_0001	ROSSI	05/03/19 00:00	05/03/19 23:59	3.500 kg	AAAROSSIGANA	VL		
04/03/09 12:11	CAPRARI_caprari_04-03-09_0011	CAPRARI	05/03/19 00:00	05/03/19 23:59	3.800 kg	FONDERIA CENTAURO	CAPRARI		
04/03/09 12:09	CAPRARI_caprari_04-03-09_0010	CAPRARI	05/03/19 00:00	05/03/19 23:00	4.500 kg	S.W.M. S.P.A.	CAPRARI		
04/03/09 12:01	CAPRARI_caprari_04-03-09_0009	CAPRARI	05/03/19 00:00	05/03/19 23:59	360 kg	C. & G. SNC	CAPRARI		
04/03/09 12:00	CAPRARI_caprari_04-03-09_0008	CAPRARI	05/03/19 00:00	05/03/19 23:59	2.000 kg	CAPRARI	FONDERIA CENTAURO		

Figure 31 – Transport request planning list

Once the broker has selected the transport requests to plan, he can chose the planning type: (Figure 32)

- **I-FC** - Internal Finite Capacity
- **E-FC** - External Finite Capacity
- **IC** - Infinite Capacity

Figure 32 – Planning types

Depending on the chosen planning type, the system shows the corresponding planning equalizer, to set the planning parameter (Figure 33, Figure 34).

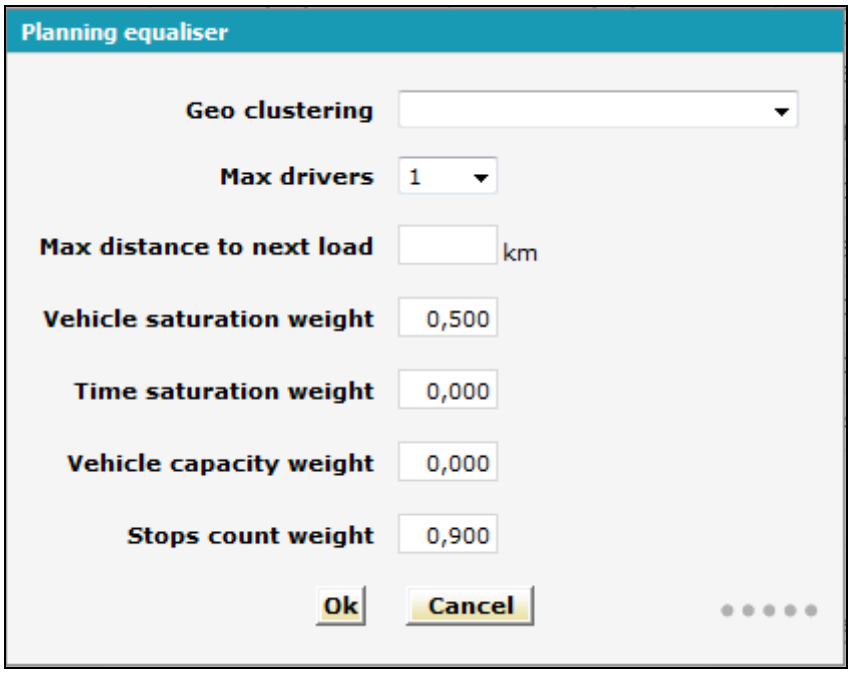


Figure 33 – I-FC and E-FC planning equalizer

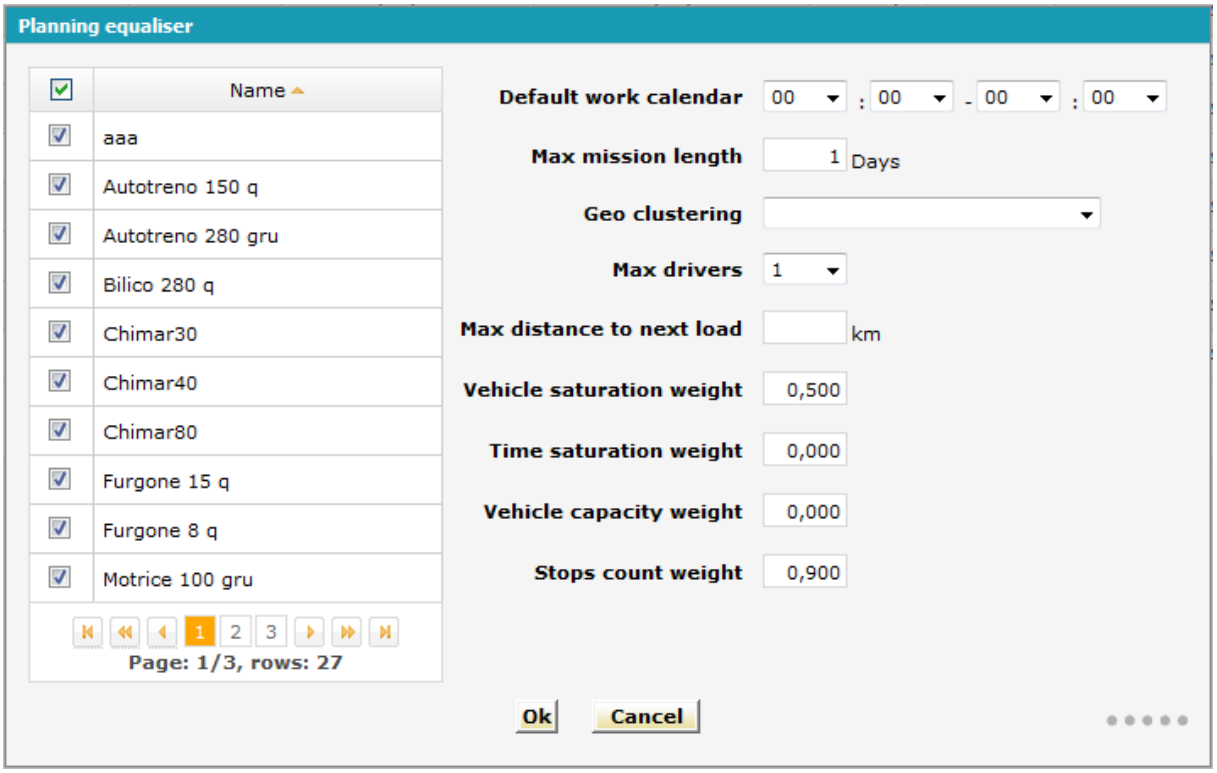
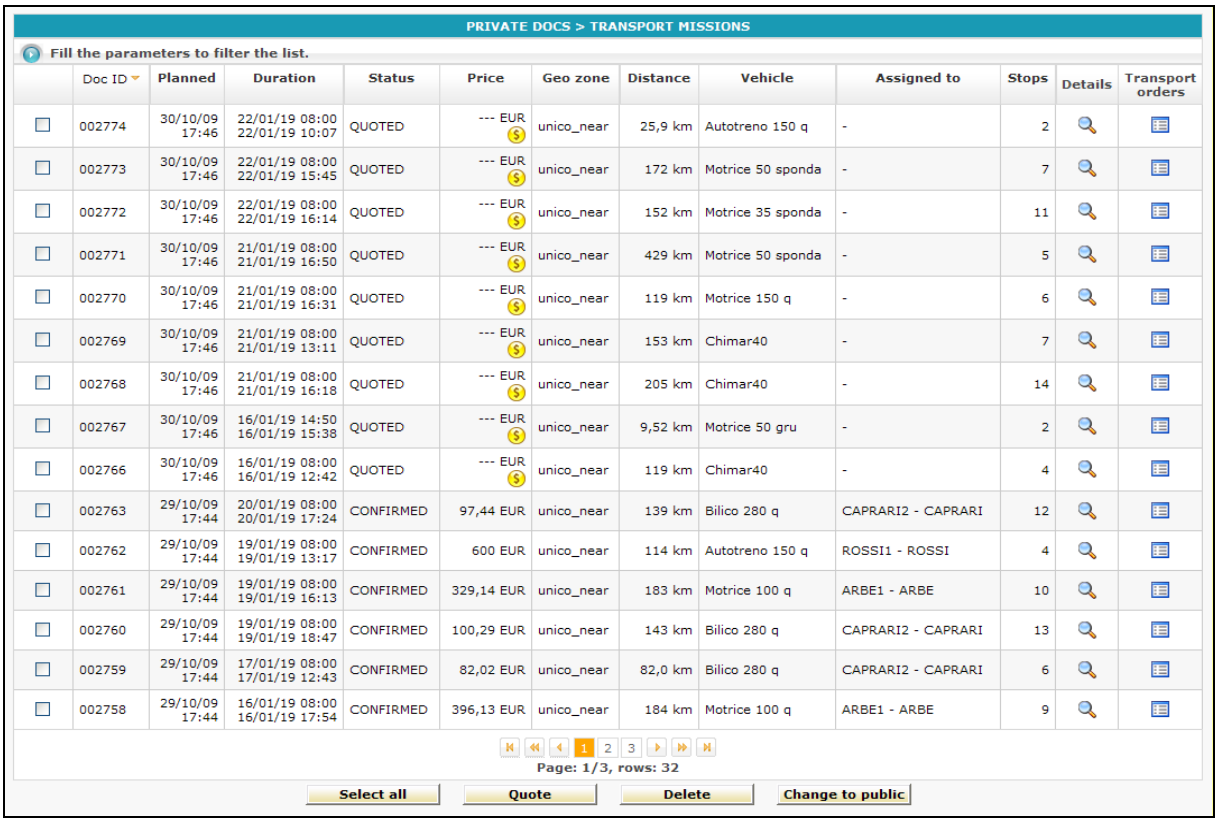


Figure 34 – IC planning equalizer

The result of planning is in **Private docs** (transport missions). It is shown in Figure 35.



PRIVATE DOCS > TRANSPORT MISSIONS

Fill the parameters to filter the list.

	Doc ID	Planned	Duration	Status	Price	Geo zone	Distance	Vehicle	Assigned to	Stops	Details	Transport orders
☐	002774	30/10/09 17:46	22/01/19 08:00 22/01/19 10:07	QUOTED	--- EUR	unico_near	25,9 km	Autotreno 150 q	-	2		
☐	002773	30/10/09 17:46	22/01/19 08:00 22/01/19 15:45	QUOTED	--- EUR	unico_near	172 km	Motrice 50 sponda	-	7		
☐	002772	30/10/09 17:46	22/01/19 08:00 22/01/19 16:14	QUOTED	--- EUR	unico_near	152 km	Motrice 35 sponda	-	11		
☐	002771	30/10/09 17:46	21/01/19 08:00 21/01/19 16:50	QUOTED	--- EUR	unico_near	429 km	Motrice 50 sponda	-	5		
☐	002770	30/10/09 17:46	21/01/19 08:00 21/01/19 16:31	QUOTED	--- EUR	unico_near	119 km	Motrice 150 q	-	6		
☐	002769	30/10/09 17:46	21/01/19 08:00 21/01/19 13:11	QUOTED	--- EUR	unico_near	153 km	Chimar40	-	7		
☐	002768	30/10/09 17:46	21/01/19 08:00 21/01/19 16:18	QUOTED	--- EUR	unico_near	205 km	Chimar40	-	14		
☐	002767	30/10/09 17:46	16/01/19 14:50 16/01/19 15:38	QUOTED	--- EUR	unico_near	9,52 km	Motrice 50 gru	-	2		
☐	002766	30/10/09 17:46	16/01/19 08:00 16/01/19 12:42	QUOTED	--- EUR	unico_near	119 km	Chimar40	-	4		
☐	002763	29/10/09 17:44	20/01/19 08:00 20/01/19 17:24	CONFIRMED	97,44 EUR	unico_near	139 km	Bilico 280 q	CAPRARI2 - CAPRARI	12		
☐	002762	29/10/09 17:44	19/01/19 08:00 19/01/19 13:17	CONFIRMED	600 EUR	unico_near	114 km	Autotreno 150 q	ROSSI1 - ROSSI	4		
☐	002761	29/10/09 17:44	19/01/19 08:00 19/01/19 16:13	CONFIRMED	329,14 EUR	unico_near	183 km	Motrice 100 q	ARBE1 - ARBE	10		
☐	002760	29/10/09 17:44	19/01/19 08:00 19/01/19 18:47	CONFIRMED	100,29 EUR	unico_near	143 km	Bilico 280 q	CAPRARI2 - CAPRARI	13		
☐	002759	29/10/09 17:44	17/01/19 08:00 17/01/19 12:43	CONFIRMED	82,02 EUR	unico_near	82,0 km	Bilico 280 q	CAPRARI2 - CAPRARI	6		
☐	002758	29/10/09 17:44	16/01/19 08:00 16/01/19 17:54	CONFIRMED	396,13 EUR	unico_near	184 km	Motrice 100 q	ARBE1 - ARBE	9		

1 2 3

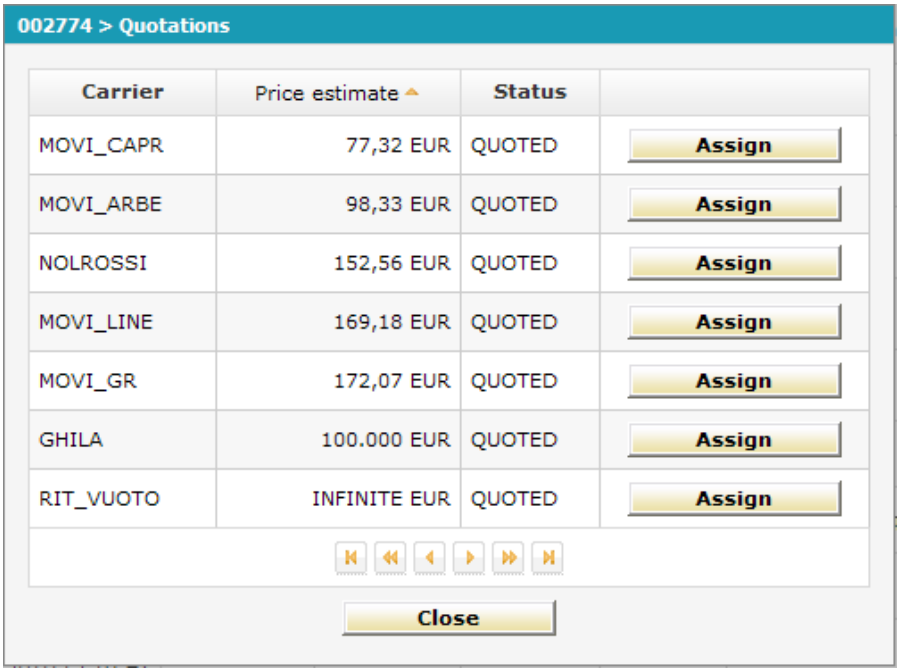
Page: 1/3, rows: 32

Select all | Quote | Delete | Change to public

Figure 35 – Planning result (transport missions)

Some of the transport missions (the ones with the dollar symbol that haven't yet got any price value) need to be assigned to a logistic operator.

By clicking the **dollar** icon the quotations popup appears (Figure 36)



002774 > Quotations

Carrier	Price estimate	Status	
MOVI_CAPR	77,32 EUR	QUOTED	Assign
MOVI_ARBE	98,33 EUR	QUOTED	Assign
NOLROSSI	152,56 EUR	QUOTED	Assign
MOVI_LINE	169,18 EUR	QUOTED	Assign
MOVI_GR	172,07 EUR	QUOTED	Assign
GHILA	100.000 EUR	QUOTED	Assign
RIT_VUOTO	INFINITE EUR	QUOTED	Assign

Close

Figure 36 – Quotations popup

The broker can assign the transport mission to one of the listed logistic operators by clicking the **Assign** button, then the logistic operator may confirm or refuse the proposal (Figure 37).

Figure 37 – Transport mission proposal

When the logistic operator confirms the transport, it has to fill the plate number of the vehicle which will perform the service (Figure 38).

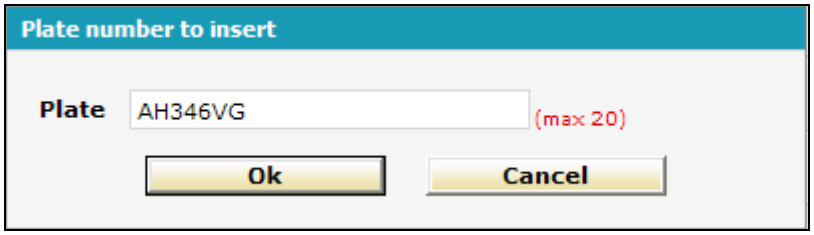


Figure 38 – Plate number popup

The transport mission is now priced with the amount applied by the assignee (Figure 39).

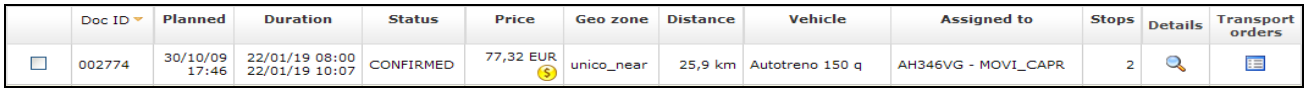


Figure 39 – Priced transport mission

By clicking the **Details** icon the details of the transport mission appear (Figure 40) and the broker is able to edit it.

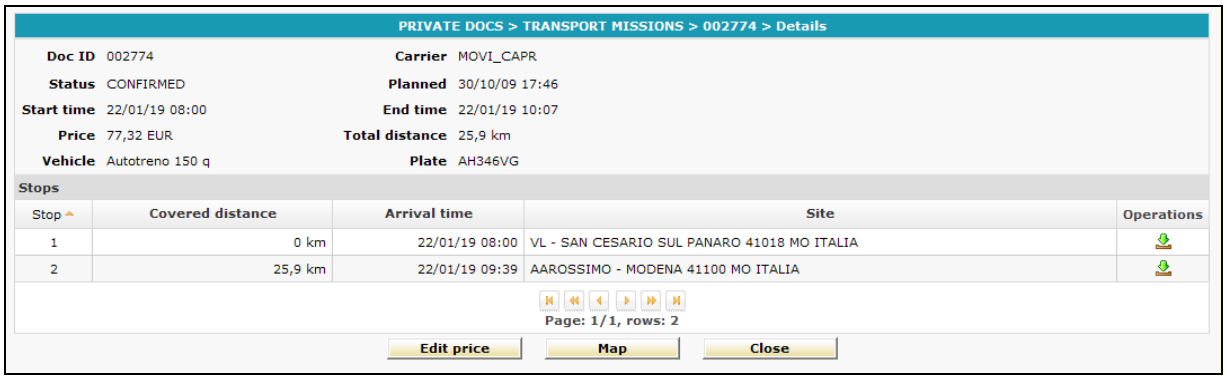


Figure 40 – Transport mission details

8.1 Document life cycle

Finite Capacity Planning

When a transport mission is planned, its status is automatically set to CONFIRMED. Furthermore, this mission is inserted among the private documents of the broker. When the broker publishes the transport mission, then it is displayed by the assignee and any user company which owns at least one transport order inside the mission, among their public documents.

Infinite Capacity Planning

When a transport mission is planned, its status is automatically set to QUOTED. This mission is inserted among the private documents of the broker.

The broker now assigns the transport mission to a logistic operator and the document status moves to ASSIGNED.

Prior to proceed in the transport mission life cycle, the broker needs to publish the document, in order to make it visible to the assignee, which will then be able to interact in the assignment phase.

If the logistic operator confirms the service, the status goes finally to CONFIRMED; indeed, if it refuses the assignment, then the status goes back to QUOTED until there is at least one candidate assignee. After the last logistic operator refuses the proposal, the transport mission goes to NOT EXECUTABLE.

9 Private docs – Transport missions

Figure 41 – Private docs

9.1 Transport mission

- The **Transport Mission** page in Figure 42 shows the list of the planned missions, each represented by identifier, total number of km, mission duration (expressed as date and time interval in which it is planned), the geographical cluster the visited sites belong to, type of truck, truck plate (in case of finite capacity), proposed logistic operator (in case of infinite capacity).
- By clicking the **Change to public** button, the selected items will be published and sent to the public documents and the selected items are visible to the other users.

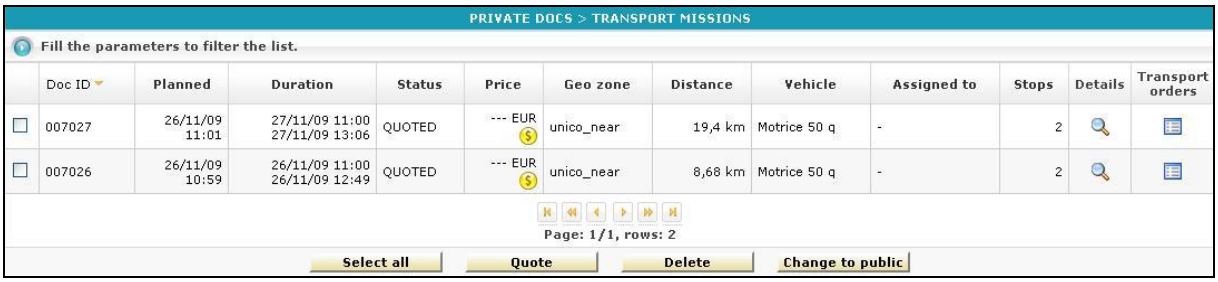


Figure 42 – Missions

The mission state, depending on the negotiation with logistic operators, can assume the following values according to the ontology values:

- **ASSIGNED**: the mission is tentatively assigned to a selected carrier;
- **COMPUTED:** the mission has just been computed by the planning algorithm;
- **CONFIRMED**: the carrier accepts to perform the mission;
- **PERFORMED:** the transport mission has been performed (delivery time reached).

The **Price** (Euro*)* icon shows the price of the selected mission (Figure 42) if the mission is assigned to a truck of one of the available internal fleets. In case the mission is proposed to logistic operators, the list of prices (computed on the basis of the available price-lists) of the candidate logistic operators is shown (the top operator being the one proposing the best conditions).

The **Transport orders** icon (Figure 43) shows the details of the orders grouped in that mission, reporting for each of them identifier, customer, availability date and time, delivery date and time, weight, number of stops, upload and download sites.

Figure 43 – Transport order icon

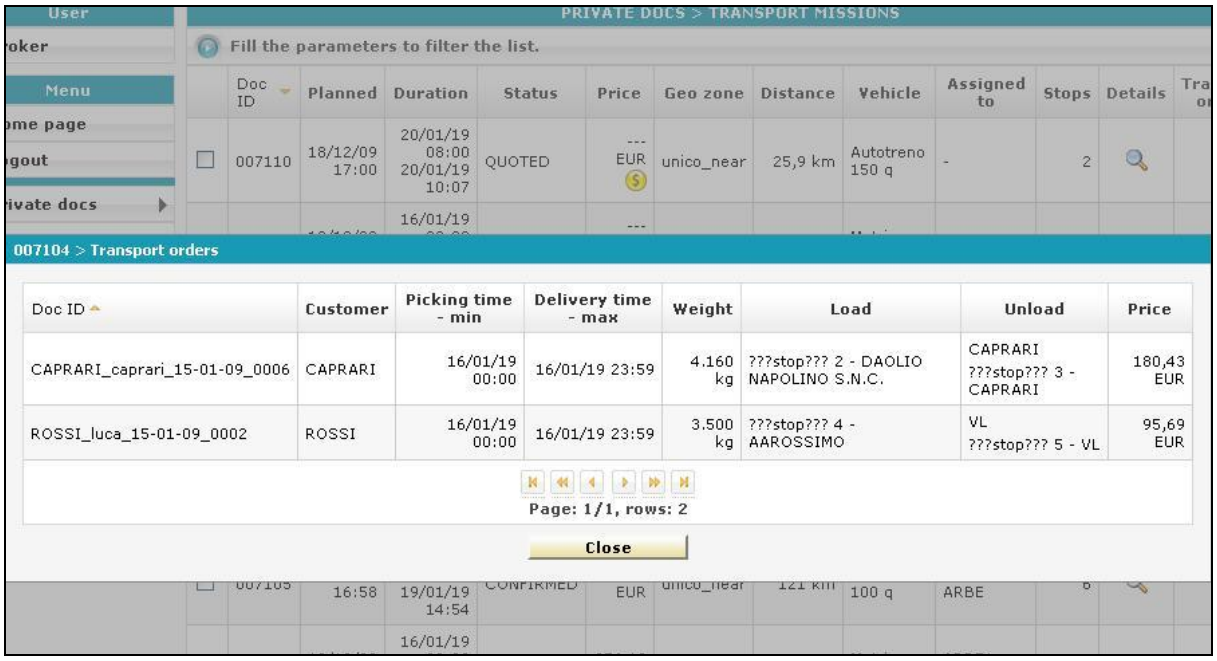


Figure 44 – Transport orders

The **Detail** icon allows to see the mission detail (Figure 45).

Figure 45 – Detail icon

The **Mission detail** page can be split into three sections (Figure 46):

- the information detailing the mission, described above;
- the **stops** the truck is expected to perform during the mission; each stops is described by:
  - order number
  - distance covered from the initial site (for the first stop such distance is zero)
  - arrival time
  - site
- the **operations** to perform at each stop; each operation is described by: (Figure 47, Figure 48)
  - related stop (more operations can be performed at the same stop)
  - start time
  - operation type (loading or downloading)
  - *handling* time for the operation
  - served order

Figure 46 – Mission details

Figure 47 – Operation icon

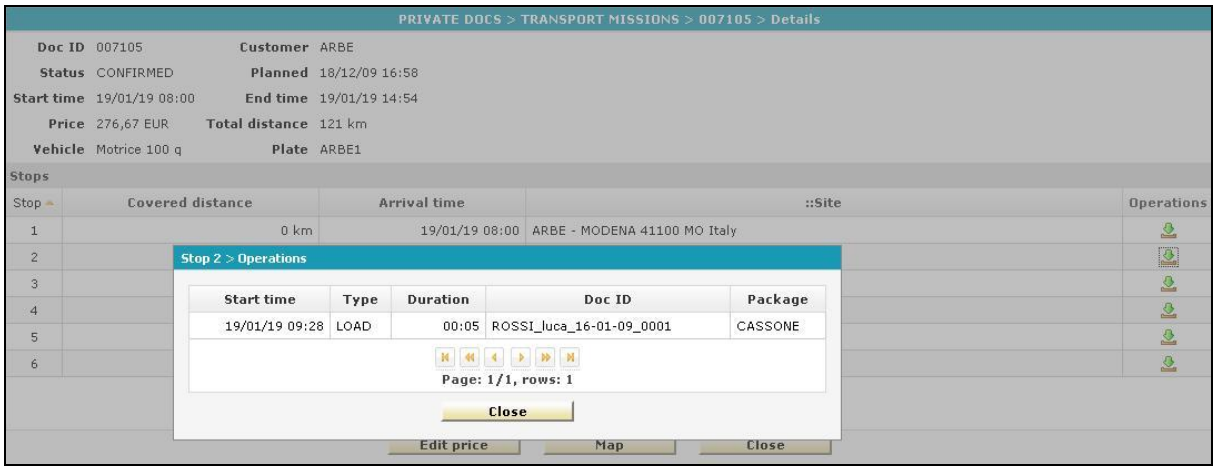


Figure 48 – Mission details (operation detail)

The user can also **filter** the list (Figure 49), by specifying a number of fields, such as, Doc ID, Status, Start day, time, time (expressed in hours and minutes), owner. To delete the filtering click **Clear**.

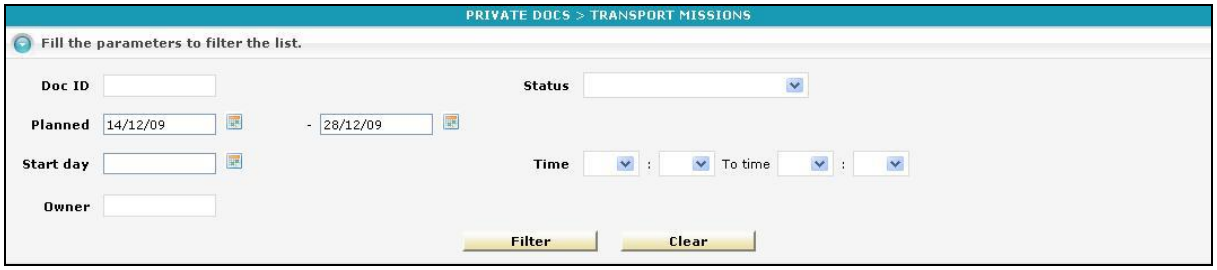


Figure 49 – Filter a list

10 Users

The **Users** page (Figure 50, Figure 51) shows the list of the users registered in the system, in particular *username*, name, role, company. The role determines which sections of the application the user can access and has three values: broker, customer, logistic operator.

Figure 50 – Users

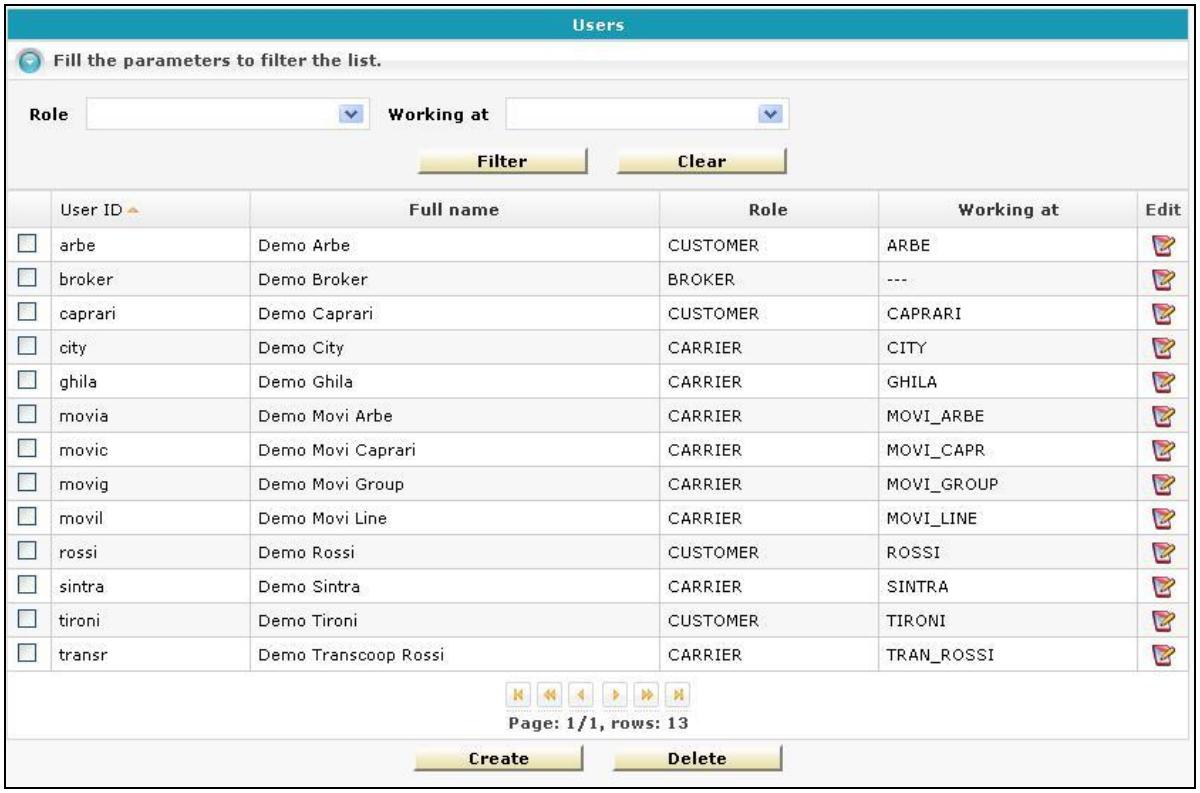


Figure 51 – Users page

The **Edit** icon (Figure 52) allows in turn to show the selected user details and modify the profile information.

Figure 52 – Edit icon

It is possible to order the list by selecting the column of interest in upward or downward direction. In Figure 51 the list is ordered according to the *User Name*.

The list can be filtered on a number of pre-defined fields: in this case, on the Role and Company columns of the table. Role and company are related with each other:

- if a user plays the role of logistic operator or customer then it is possible to choose the company;
- if the user is a broker the company field cannot be modified.

The filter can include one or more search criteria (for instance the couple role and company) and allows to enter also partial criteria (for instance, entering the string “ch” in the user name field, all the users with that string in their name are selected).

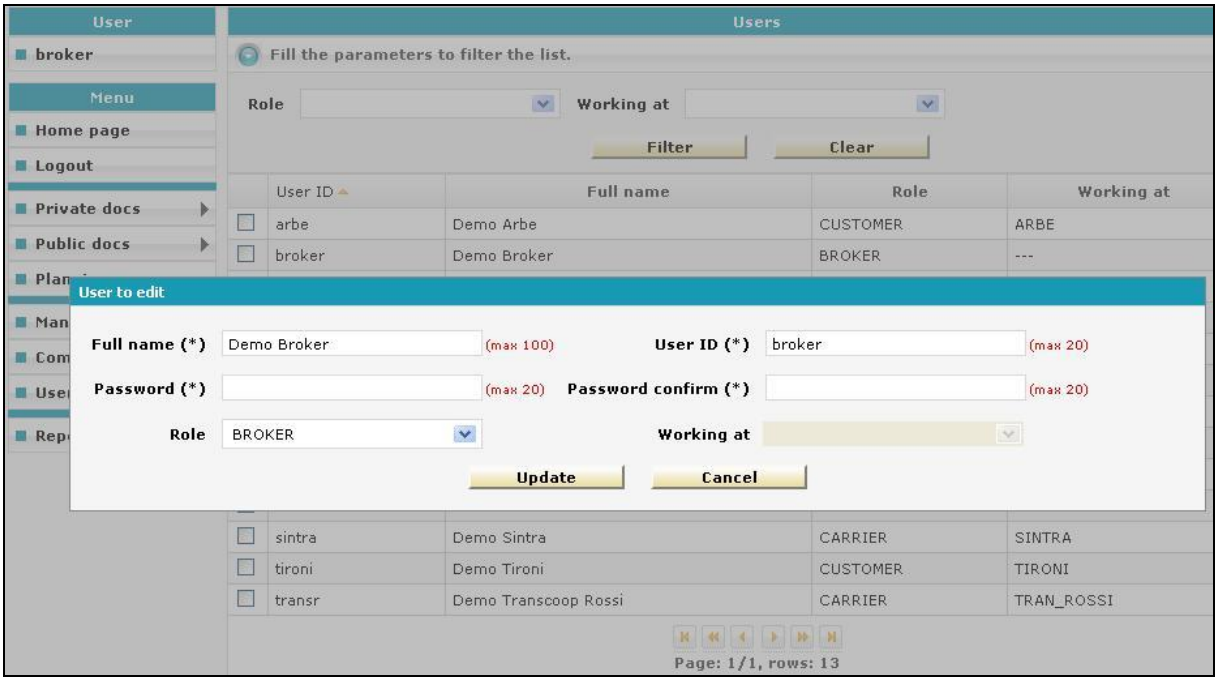


Figure 53 – Modify a user

The two buttons (**Update** and **Delete**) in the lower part of the section allows creating and deleting users. Creating a new user (Figure 54) means entering full name, username, password (to be confirmed), role and company.

The fields marked with **(*)** are mandatory, and the user must fill them. It is possible to save definitely the user or abort.

Deleting an existing user means selecting the user to delete in the main list, then pushing the **Delete** button.

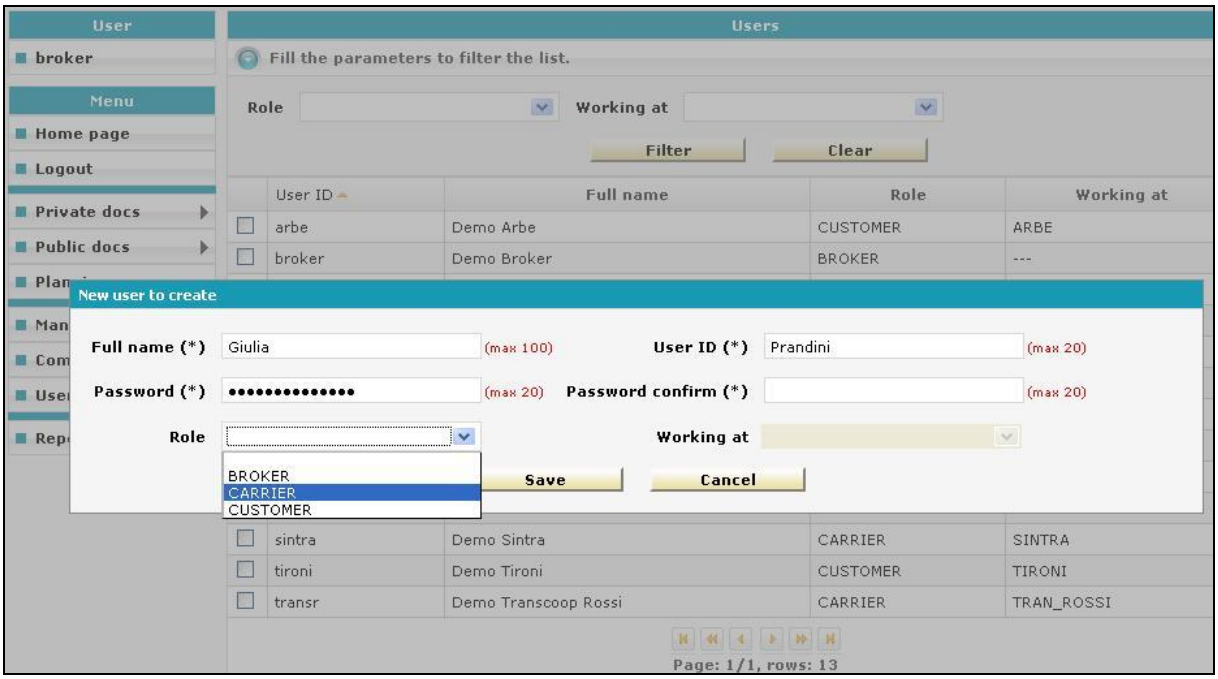


Figure 54 – Create a new user

11 Reports

Figure 55 – Reports icon

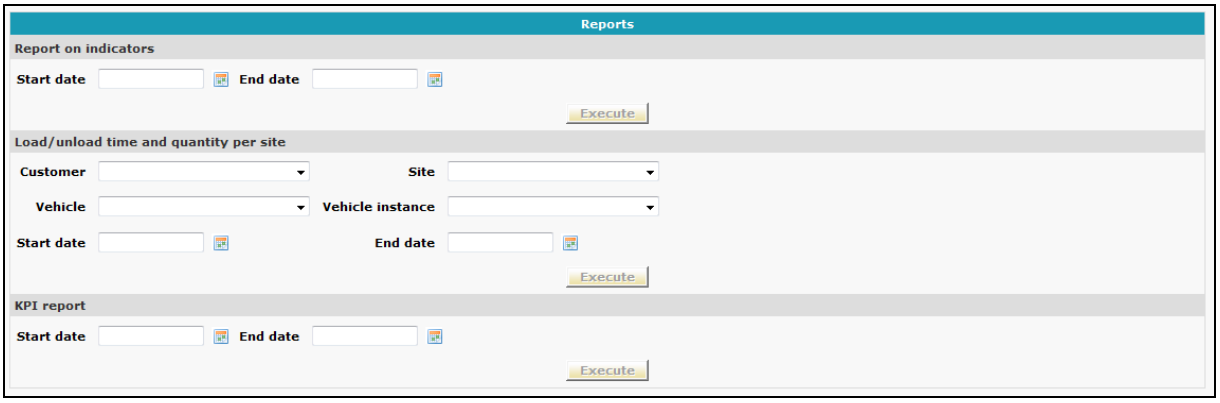


Figure 56 – Create a report

As it is shown in Figure 56 the platform offers at this stage three different types of records, respectively showing quantitative & qualitative indicators, and measures of the load/unload times at the visited sites.

Once selected one of the report, the report is generated (see Figure 57) and can be opened or saved.

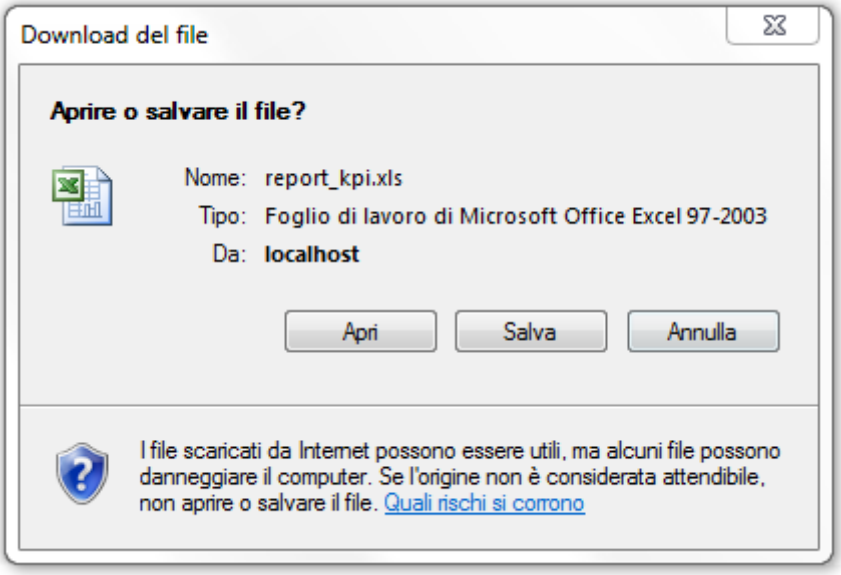

Download del file
Aprire o salvare il file?
Nome: report_kpi.xls
Tipo: Foglio di lavoro di Microsoft Office Excel 97-2003
Da: localhost
Apri
Salva
Annulla
I file scaricati da Internet possono essere utili, ma alcuni file possono danneggiare il computer. Se l'origine non è considerata attendibile, non aprire o salvare il file. Quali rischi si corrono

Figure 57 – Generated report

KPI REPORT

The KPI report compares the KASSETTS (fully consolidated) solution to the so called “BEST NULL” scenario, which assumes that:

- Companies order transport services directly at transport operator, without knowing the demand of other customer companies.
- Transport operators use the smallest vehicle available to transport the given order.

An example of the KPI report is reported in the following figure.

		Time window	from: 14/03/2011 to: 20/03/2011			
				KASSETTS*	BEST NULL*	DIFFERENCE
GENERAL	1	total number of orders	nr.	127	127	N/A
	2	total weight transported	tons	73,30	73,30	N/A
	3	percentage of international orders	%	30,71	30,71	N/A
	4	percentage of regional orders	%	69,29	69,29	N/A
COMPARATIVE INDICATORS	5	number of missions	nr.	59	70	-11
	6	total lenght of routes	km	57998,26	58749,16	-750,90
	7	tons-kilometers performed	tkm	99863,06	130326,85	-30463,79
	8	percentage of aggregated missions	%	35,59	0,00	35,59
	9	fuel used	litres	7000,58	7563,81	-563,23
	10	total CO2 emissions	tons*	1847,52	1996,17	-148,64
	11	total time on road	hours	802,0	833,0	-31,0
	12	percentage of time on road on total durations	%	64,94	67,11	-2,18
	13	number of vehicle types used	nr.	11	11	0
	14	total costs	EUR	22197,78	23825,42	-1627,64
	15	saturation coeficient (weight)	%	69,36	61,38	7,98
	16	saturation coeficient (volume)	%	14,94	16,22	-1,27
	17	saturation coeficient (surface)	%	50,62	47,49	3,13
	18	share of empty km	%	43,82	40,14	3,68

Figure 58 – KPI report

KASSETTS - KASSETTS scenario – scenario in which the KASSETTS tool calculates and optimizes best solution for the inserted transport orders with the aim to aggregate orders from different companies and thus contribute to a best solution for all involved companies and therefore lower their expenses.

BEST NULL - BEST NULL scenario - scenario in which the KASSETTS tool calculates and optimizes best solution for the inserted transport orders and aggregate orders within each company (e.g. each company can aggregate their transport requests, but cannot aggregate with goods of other companies).

GENERAL - general indicators are overall indicators, which mean that they provide a general outlook over the work of the broker node:

- Total number of orders (1) – Total number of all inserted and successfully calculated transport orders for the selected time frame.
- Total weight transported (2) - Total weight of transported cargo of all inserted and successfully calculated transport orders for the selected time frame.
- Percentage of international orders (3) – Percentage of international orders for the selected time frame.
- Percentage of regional orders (4) - Percentage of regional orders for the selected time frame.

COMPARATIVE INDICATORS:

- Number of missions (5) – Number of missions calculated by the tool using optimization algorithms (one mission may consist of one or more transport requests).
- Total length of routes (6) – Total length of all routes (performed kilometres) performed by vehicles used in transportation process.
- Tons-kilometres performed (7) – Total tonne-kilometres performed when serving transport requests.
- Percentage of aggregated missions (8) – Percentage of orders where at least two orders from different companies were transported on the same vehicle
- Fuel used (9) – Estimated amount of fuel in liters used by the vehicles which performed the designated transport missions.
- Total CO2 emissions (10) - Estimated CO2 emissions in kilograms produced by the vehicles which performed the designated transport missions.
- Total time on road (11) - Total time shown in hours for selected vehicles on the road.
- Percentage of time on road on total durations (12) – Percentage of vehicle effective work time (which vehicle spend on the road) on the total missions durations, that contain also the time for load/unload, the wait time before starting the operations and the driver's break time.
- Number of vehicle types used (13) – Number of vehicle types used in the transportation process. Different vehicle type represents vehicles with different characteristics (weight and size load capacity, etc.)
- Total costs (14) – Cost of order(s) obtained from the cost subdivision algorithm. End value of the mission (consist of one or several orders) is left to agreement between transport provider and client company or client companies if mission consist of transport request (orders) from more than one client.
- Saturation coefficient (weight) (15) – Calculated coefficient depending on the characteristics of the goods transported – weight. Coefficient is calculated as the ratio between the occupied vehicle capacity and available vehicle capacity.
- Saturation coefficient (volume) (16) - Calculated coefficient depending on the characteristics of the goods transported – volume. Coefficient is calculated as the ratio between the occupied vehicle capacity and available vehicle capacity.
- Saturation coefficient (surface) (17) - Calculated coefficient depending on the characteristics of the goods transported – surface. Coefficient is calculated as the ratio between the occupied vehicle capacity and available vehicle capacity.
- Share of empty km (18) - Percentage of performed kilometres where vehicle was not loaded (empty runs) compared with all performed kilometres.

12 Instructions for ICT platform access

A test version of the ICT platform is available with the following credentials at the following address:

User id: **broker**

Password: **broker**

http://nic.ing.unimo.it/coefficient-lsm-en